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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

MAIN ITEMS

Plant Control in South Africa
The Machine's Rôle in Spraying
Overseas News
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PLANT CONTROL SERVICES IN SOUTH AFRICA

Serious consideration was given to plant control services in South Africa during the first decade of the present century and comprehensive plant control procedures in the Union were prescribed in the Agricultural Pests Act of 1911, which has remained the basis of most of the present day plant regulatory operations.

Nursery Registration and Inspection: It is required that all nurseries producing or offering woody perennial plants for disposal should be registered annually with the Department of Agriculture, and lists of such registered nurseries are published every year for general information. These nurseries are inspected during the growing season and in cases where scheduled diseases and pests are found to exceed specific tolerances such nurseries are quarantined until the irregularity has been remedied. As a further safeguard to check the spread of diseases and pests it is required that nursery stock of major importance should be fumigated prior to consignment and be accompanied by a prescribed nursery tag certifying that this has, in fact, been performed and the material has been produced in a registered and approved nursery. During the 1954-5 season 841 nurseries were thus registered and they produced inter alia $3\frac{1}{2}$ million citrus and $10\frac{1}{2}$ million deciduous fruit trees and root stocks, $23\frac{1}{2}$ million forest trees, $3\frac{3}{4}$ million rose trees, and approximately $10\frac{1}{2}$ million herbaceous ornamentals.

Registration and inspection of vine nurseries was introduced in 1939 in order to prevent the spread of the newly discovered bacterial blight (Erwinia vitivora). Since then, between 500 and 600 vine nurseries have been registered and approximately 8 million vines and 3 million vine rootstocks offered annually by approved vine nurseries.

Under the existing system of nursery inspection and certification attention is given most particularly to diseases and pests of major importance discernable on stocks in the nurseries. However, many diseases, especially some bacterial and virus diseases, are known not to manifest themselves in nurseries sufficiently distinctly to enable identification and elimination through nursery inspections. Inspection and certification of their origin seem to be a prerequisite to sound

nursery practice, and consideration is therefore being given to the introduction of a system of 'stud' orchard certification to be followed by 'stud' nursery certification.

Sugar-Cane Inspection: Sugar-cane varieties proved to be immune, highly resistant, or tolerant to virus diseases, especially mosaic, are scheduled for planting. Inspection services are maintained to ensure that approved varieties only are grown and to obtain data on the occurrence of virus and other diseases in the main sugar-cane areas.

Seed Potato Certification: Field and tuber inspections for the certification of seed potatoes in approved areas are undertaken on a voluntary basis. For the AA certificate potatoes are grown mostly under irrigation in areas approximately in the centre of the Union where high summer temperatures prevail and where the annual rainfall is very low. Seed potatoes for the lower standard (A certificate) are produced in limited areas in all four provinces of the Union.

Control of Import of Plants and Plant Material: Very strict control of the importation of plants and plant material has been maintained from the earliest stages of the plant control services in the Union. Ordinarily, plants cannot be imported without an authorisation from the Department of Agriculture. Every application for an import permit is carefully checked and, if granted, such conditions regarding phytosanitary certification, special assurance against diseases and pests of particular importance, and treatment and quarantine as are deemed necessary may be added to the permit as requirements to be complied with. Not only is the introduction of certain listed plants (e.g. Coniferae, Acacia spp., Eucalyptus spp., etc.) and soil prohibited but the importation of varieties of these plants, considered to be of major economic importance in this country, is also restricted to new ones unobtainable in the Union, and also limited to a few plants of each variety. The phytosanitary control on import has been extended to embrace plant products, such as cotton, timber, and tobacco.

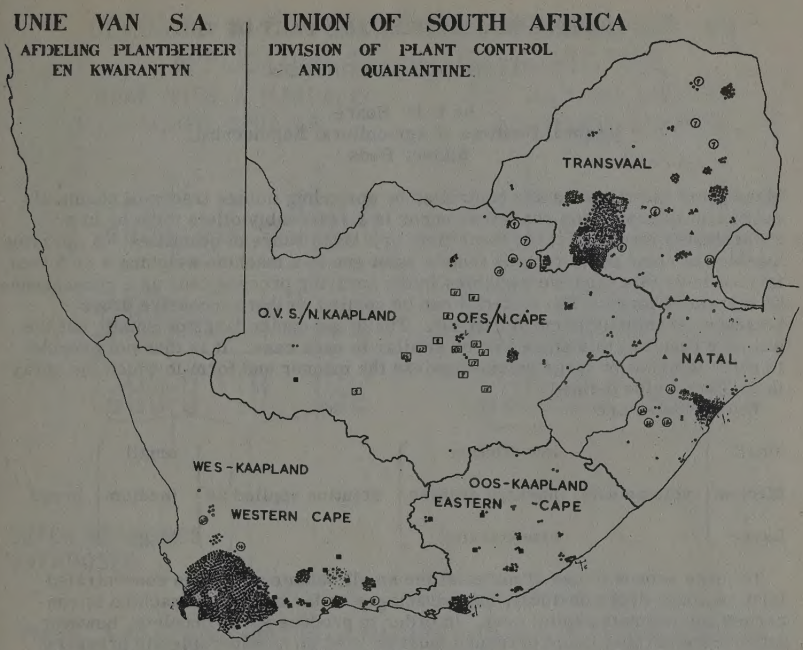
Plant inspectors are stationed at all the approved main ports of entry and all plants and plant material are checked, examined, and treated, if necessary, prior to release to the consignee. Quarantine of imported sugar-cane plants is undertaken at Durban, in co-operation with the South African Sugar Association, in glasshouses specially provided for this purpose by this Association. Until now limited facilities in the vicinity of Cape Town have been available for the quarantining of imported plants of major importance. The establishment of well-equipped quarantine facilities in the vicinity of Stellenbosch, Cape, is now in progress and, when completed, isolation and quarantine testing at a high level of efficiency is envisaged.

Phytosanitary Certification for Export: When countries to which plants and plant material are to be exported require phytosanitary certificates such inspections during the growing season and at the port of shipment are carried out as are deemed necessary for reliable certification. This function is carried out with the conviction that reliability of certification can be the most valuable contribution to international co-operation in the phytosanitary field.

When plants for propagation are to be certified for export the regulations governing the movement of plants within the Union are strictly applied; phytosanitary certification is not undertaken unless such plants have been grown in a registered and approved nursery. Prior to certification, therefore, all such plants have been inspected during their growing phase in the nursery and at the time when offered for export.

Measures to Prevent the Spread of Diseases and Pests of Major Importance: Special regulations governing the planting or movement of plants have been promulgated to prevent the spread of major diseases and pests still occurring in localised areas. This refers especially to psorosis of citrus, wart disease (Synchytrium endobioticum) of potatoes, pernicious scale (Quadraspidiotus perniciosus), and white-fringed beetle (Graphognathus leucoloma).

Since the successful completion of citrus canker eradication in the second decade of this century no similar campaign has been undertaken in this country.



Plant Control Regions in the Union of South Africa and Distribution of Nurseries

Compulsory Cleansing of Orchards: Several districts in the Union of South Africa have been promulgated under the Orchard Cleansing Act of 1947 as areas in which the control of scheduled pests and diseases is compulsory. The plant control services are co-operating with local bodies to promote successful control and are specially supervising programmes for the control of pests and diseases considered to be of major importance.

Organisation: In 1953 a separate Division of Plant Control and Quarantine was formed to handle all regulatory procedure in connection with phytosanitary control in the Union of South Africa, services previously undertaken by the Divisions of Entomology and Plant Pathology.

In order to attend to all the phases of regulatory plant control in the Union the Division of Plant Control and Quarantine has demarkated five Plant Control Regions in each of which plant inspection units have been stationed under the care of a senior officer and at points most strategic for the purposes of plant control. This organisation is administered from the head office of the Division and has proved to be very successful, in spite of the enormous distances which many plant inspecting officials have to travel to places where their services for inspection and certification are required.

Chief, Division of Plant Control & Quarantine, Stellenbosch — S.J. du Plessis

Change of Address

The new address of the Commonwealth Bureau of Agricultural Parasitology (Helminthology) is White House, 103, St. Peter's Street, St. Albans, Herts, England.

THE SPRAYING MACHINE AS A PART OF THE PATHOLOGICAL CONTROL

by E.R. Hoare
National Institute of Agricultural Engineering,
Silsoe, Beds.

Many pests and diseases are controlled by spreading minute traces of chemicals over plant tissue. This can either occur in a reasonably dilute form or in a concentrated form and at the same time in a large range of quantities. A spraying machine of some sort, ranging from a paint gun to a machine weighing 4 or 5 tons, is used to do this, and the variables in the spraying process can, as a consequence, be extremely large. The material can be applied so that successive drops coalesce, eventually to cause run-off. The drops can be large or small, but the ultimate result at this stage will be similar in each case. It is thus not precise to refer to small or large volumes unless the manner and form in which the spray is applied is also defined.

The variables are:-

Small	volume with	low dilution	solution applied as	small	drops
Medium		medium dilution		medium	
Large		concentrated		large	

To make economic use of material the small volume applied in concentrated form in small drops obviously has advantages so far as size of machine is concerned and ultimate capital cost. In order to produce small droplets, however, either considerable liquid pressure must be used or considerable air pressure, so that the relative velocity between the air and the liquid is great. At the other extreme there is the large volume-low dilution spray with large drops, which means a lot of material to be moved over the crops and relatively large liquid pumps to handle it. Generally, most development work is occurring on the machinery for spraying a small volume of concentrated solution with small drops.

It is often assumed that when trees and other herbage are sprayed with a large volume of large drops until run-off occurs that the coverage must of necessity be more even, and hence better, than a small volume applied as indiscrete drops. This would occur if all the various parts of the plant received similar quantities in the same time. Since the droplets are large the outside leaves of the trees receive the larger quantity and the inside may not receive much. This is shown in fig. 1. When the large drops are applied in dosages not sufficient to cause run-off then the spaces between the drops become larger than the spaces produced from a greater number of small drops.

This is best illustrated if the number of drops of a given size in an ounce of fluid is tabulated (table 1). Thus, if the defensive distance is large around each

Table 1

Number of particles contained in an ounce of spray material

Microns diam.	Number
10	38,000 million
50	304 "
100	48 "
200	6 "

particle then a solution of 50-micron droplet, distributed evenly, has a protection cover 50 times as great as a solution of 200-micron droplet. It is this aspect that may apply in the case of a fungicide (fig. 2). An insecticide, however, may depend on the quantity of insecticide consumed in a given period of movement by the insect, in which case the amount of material applied to the area of movement

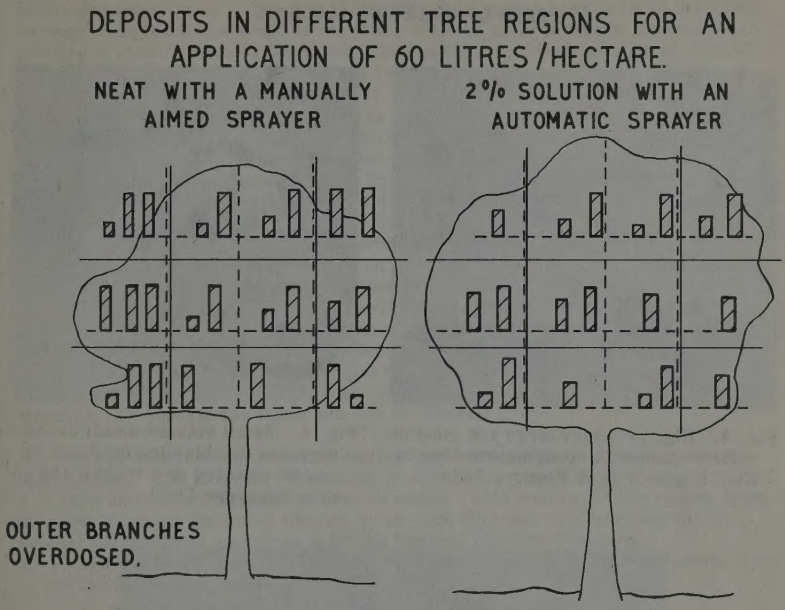

DEPOSITS IN DIFFERENT TREE REGIONS FOR AN APPLICATION OF 60 LITRES/HECTARE.
NEAT WITH A MANUALLY AIMED SPRAYER
2% SOLUTION WITH AN AUTOMATIC SPRAYER
OUTER BRANCHES OVERDOSED.

Fig. 1. A small dosage applied concentrated (left) does not have much greater variation than a 2 per cent. solution applied until run-off occurs. (N.I.A.E. photo)

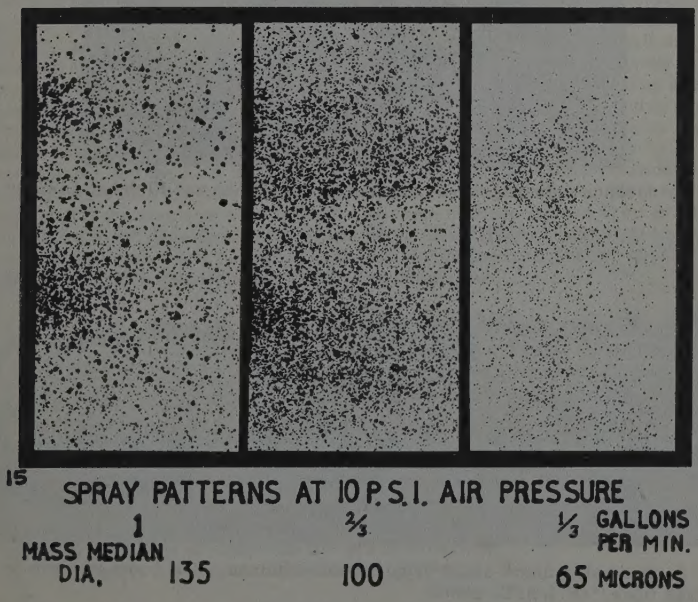


Fig. 2. On the right one third of the material is used to better advantage in giving good "cover". (N.I.A.E. photo)

TYPES OF SPRAYING MACHINE

Fig. 3. High pressure large and medium volume automatic spraying machine by Kent Engineering & Foundry Ltd.

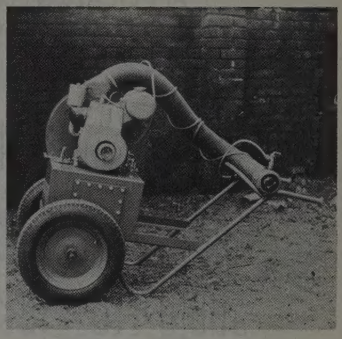


Fig. 4. Small volume-small droplet spraying machine for hand use or can be mounted on a tractor (Micron Sprayers Ltd.)

Fig. 5. Medium volume ground crop machine by Drake and Fletcher Limited.

Fig. 6. A small volume-small droplet boom machine. The boom is made from glass fibre. (N.I.A.E. photo)

is the dominant factor. The small droplets may in this case have no direct advantage over the large droplets but there must be no area where the insect is capable of moving without contacting the insecticide, which may occur if the distribution from one part of the tree to another is uneven: small droplets are capable of spreading more evenly over a tree. From the evidence so far collected the tendency will therefore be to evolve machines which carry the spray fluid to the points of application in concentrated form but in small drops.

As the droplet size becomes smaller the amount of drift may increase. It must not be assumed, however, that in sprays of large droplet size there is no drift for when a large quantity of liquid is sprayed the actual drift in terms of quantity of fluid may often be greater than in small volume-small droplet spraying. The drift effect is important when herbicides are considered and the dominant factor is the closeness of the spray outlet to the crop. In spraying swards the spray boom should be as close as is possible, bearing in mind that any slight unevenness of the ground is accentuated very greatly at the end of a wide boom. There are therefore limitations to the swath width of the machine dependent on the type of land, and this in turn affects the working height of the boom (fig. 6).

The topography, combined with the type of crop, may settle the final shape and weight of the machine. Thus there is no one, universal, type of spraying machine. In general the machines can be classed into:-

1. High pressure-large volume, having lance or automatic pressure spray distribution. The K. E. F. Penetrator is such a machine (fig. 3).
2. Medium volume at medium droplet sizes. This covers a wide range, from directly-mounted machines like the Drake and Fletcher machine (fig. 5), to special contractors' machines made by Dorman Sprayer Company.
3. Small volume-small droplet machines. This type of machine is exemplified in the Micron range (fig. 4).

When performing spraying experiments it is essential that the variability of the spraying machine is reduced to a minimum. The operating liquid pressure, the air flow, and the droplet size should be known and kept constant. The assessment of cover should be made on a physical analysis as well as a chemical analysis. The distribution of the fluid over the crops should be known and the control of the pest or disease should be related to the application dosages as they are known to exist, and not to the figures of output of the machine. In very small drop spraying as much as 80 per cent. may be lost in drift. Over large areas this may not be a disadvantage, as successive swath treatments can build up a final dose. There are also the factors relating to very mobile insects moving from contaminated into non-contaminated areas. When commercial machines are being used it is these factors that make factorial experiments extremely difficult to translate, and the final solution may even result in large area treatment. It also indicates that the final problem of control is not settled until the large scale commercial treatment is investigated. If some of these factors are remembered when large scale commercial control is being investigated it may help in arriving at a correct assessment of the machine's performance irrespective of the chemical which is usually under test at the same time.

Wheat Rust Conference

The third International Wheat Rust Conference, held at the invitation of the Department of Agriculture of Mexico in Mexico City, terminated on March 24th. The principal discussions centred round the problem of the identification of sub-races of rusts in different countries. It was suggested that standard differentials be maintained but agreement sought on the use of supplementary varieties for sub-races, in order to avoid the present ambiguity. A committee was set up to study the possibility of international agreement on the establishment of pure line cultures from single uredospores for use in breeding.

A fuller report will appear in the July C. P. News.

A project which may have unforeseen repercussions for scientific abstracting is the mechanical translator at Birkbeck College, London, for which a grant-in-aid of £7, 200 has been made by the Nuffield Foundation.

PERSONAL NEWS

Visitors to C.M.I.

Among overseas visitors were A. Angus, N. Rhodesia; B.P. Chakravarti, India; S.R. Chant, Nigeria; W.P. Mowat, Sarawak; Prof. A.G. Newhall, Cornell University; J.S. Robertson, Nigeria; Dr. W.R. Stanton, Gold Coast; B.A. Stone, Australia; Dr. P.O. Wiehe, Mauritius.

Appointments, Transfers, and Retirements

The following appointments have been announced by the Overseas Division of the Colonial Office: J.D. Broatch, director of agriculture, Gold Coast; Dr. J.M. Waterston, director of agricultural research, Nigeria; E.W. Momber and T.A. Phillips, deputy directors of agriculture Northern and Eastern Regions, Nigeria, respectively; I.W. Hughes, assistant director of agriculture, Bermuda; A.R. Melville, chief research officer, Kenya; Miss F.M. Roberts, principal scientific officer, plant pathology, Kenya; W.H. Foster, senior scientific officer, botany and plant breeding, Northern Region, Nigeria; A. Angus, plant pathologist, N. Rhodesia.

F.W. Toovey, until recently director of W.A.I.F.O.R., Nigeria, has been appointed director at the Glasshouse Crops Research Institute, Rustington, Sussex.

The new Chair of genetics at Glasgow University has been accepted by Prof. F. Pontecorvo F.R.S., who will continue his researches on the genetics of fungi.

Prof. E. Gäumann, professor of plant pathology in the Swiss Federal Institute of Technology, Zürich, has been elected a foreign associate of the Paris Academy of Sciences in succession to the late Prof. A.F. Blakeslee.

Dr. D.H. Lapwood has been appointed to the staff at Rothamsted and is working on Phytophthora infestans.

Awards

Prof. S.M. Wadham, professor of agriculture at Melbourne University, Australia, was awarded a knighthood in the New Year Honours List.

Dr. E.L. Dulaney has been awarded a National Research Council of Canada research fellowship in mycology and will work under Dr. R.H. Haskins at the Prairie Regional Laboratory.

AWARD TO DR. G.R. BISBY

Many C.P. News readers will be pleased to hear of the award of the gold medal for outstanding achievements of the University of Minnesota (his alma mater) to Dr. G.R. Bisby. The medal, accompanied by a certificate for work of "high eminence and distinction", was presented to him at a brief, informal ceremony at his home in Staines, Middlesex, by Dr. Myron L. Koenig, Cultural Attaché of the American Embassy, on 2nd March. Dr. Wiltshire was present and conveyed the congratulations and good wishes of the C.M.I. staff to Dr. and Mrs. Bisby.

OBITUARY

Dr. H. Wormald, who died on 10th December, 1955, was distinguished for his pioneer work on the pathology of fruits and hops and more particularly for his original researches on brown rot (Sclerotinia spp.) and bacterial canker (Pseudomonas mors-prunorum and Ps. prunicola), on both of which subjects he became an authority of international repute. He went to Wye College (University of London) as Assistant in the Botany Department in 1911, and was awarded the D.Sc. degree in 1919 for his brown rot work. He was the first Head of the Plant Pathology section, East Malling Research Station, becoming Assistant Director in 1936. In 1940 he was President of the British Mycological Society and joint editor of the 'Transactions' from 1931-45. He also served as a member of the Council of the Association of Applied Biologists (1937-39) and as a Vice-president (1938-39). He was well known throughout the world for his two principal works, 'The Brown Rot Diseases of Fruit Trees'. and 'The Diseases of Fruits and Hops', the second edition of which has been published recently.

OVERSEAS NEWS

NOTES FROM CANADA

BROWN ROT OF STONE FRUITS IN THE NIAGARA PENINSULA

In the Niagara peninsula, a favoured area for the cultivation of tender fruits, some 12,800 acres are devoted to peaches, and the annual production is about 2 million bushels. Because peaches and other stone fruits are intensively cultivated in a rather small area situated between Lake Erie and Lake Ontario, two large bodies of water, conditions are extremely favourable for the development of brown rot caused by Sclerotinia fructicola (Wint.) Honey. The disease is an annual problem and the cause of considerable loss to growers, shippers, dealers, and consumers.

In an effort to prevent losses growers follow a control programme, which includes a spray schedule and orchard practices designed to reduce sources of infection. Both means of control are essential. In some seasons, however, factors other than the application of fungicidal sprays prove of great importance.

Apothecia of the fungus are produced abundantly in the orchards on rotted, mummied fruits that have become slightly buried in the soil. They appear about the time the trees commence to bloom and remain to discharge ascospores for a week or ten days, during which they infect the blossoms of cherries, plums, and peaches. The resulting blossom blight is often followed in peaches by the formation of small cankers as the fungus advances into the wood. Sporodochia are produced freely at this time and supply inoculum for subsequent infections of the fruit. Rot may occur on the green cherry fruit, then on the maturing, and finally on the ripe fruit, and in this way a very heavy spore load is provided for the later peaches. Early season peaches, most of which are highly susceptible to rot, are ripe soon after the cherry harvest, and the maturity date for these varieties is such that an almost continuous and ever-increasing supply of spores is produced.

In the early season growers adopt several measures: (1) orchard cultivation prior to the bloom period to disturb over-wintered mummies and prevent apothecial formation, (2) removal from the trees of adhering mummied fruits, which under favourable conditions will produce sporodochia, and (3) application of pre-bloom and bloom fungicidal sprays and, later, of recommended insecticidal cover sprays. In recent years there has been a vast improvement in the brown rot situation in the orchards. This can be attributed to a greater appreciation on the part of the growers of the importance of these measures, to the improvement of pesticides which have given better control of insect damage so frequently followed by rot, and to more adequate spray equipment.

The problem, while lessened by these advances in orchard practices, still remains an acute one in respect of the wastage of harvested fruit. In the average season much can be done to prolong the "shelf" life of the fruit by the following measures: late-season fungicidal applications, especially those applied just before harvest; care in the picking, grading, and packing operations; pre-cooling and cold storage; expeditious marketing; and proper handling at the retailer and consumer level. In some seasons, however, even these precautions fail. This was the case in the Niagara peninsula in 1955. A review of the situation illustrates well some of the factors contributing to the moderate to heavy losses resulting from brown rot and points out the difficulties faced by the grower in supplying sound quality fruits to the market.

Apothecia were moderately abundant and developed during a cool, rainy period of approximately 48 hours on April 25th-26th, at the time when the first blossoms on peach and sweet cherry were open. The weather faired and remained so through full bloom and early petal-fall, at which time, May 4th, the apothecia had withered and disappeared. Conditions for infection were unfavourable and consequently the disease in the early season was unimportant. In sprayed orchards, infections on blossom parts were sparse and there was little further development in the early summer. Up to and including mid-summer the weather continued dry and very warm. The warm weather served to hasten maturity so that unusually heavy supplies of both early and mid-season varieties became available at the same time and the markets were soon over-supplied, serious delays being experienced in moving fruit to market outlets. Brown rot developed

on packaged fruit held for shipment, on unpicked, over-ripe fruits, and on fallen fruits, and thus spores in great abundance were produced and dispersed in the orchards, packing sheds, and shipping centres. The disease was also common in shipments delayed in reaching distant market destinations. Several heavy storms broke the prolonged drought conditions. Hail in some areas, together with driving rains and lashing wind, was very damaging to varieties approaching maturity and resulted in slight skin punctures and bruises where rot subsequently developed rapidly. This served to nullify to a great extent the value of pre-harvest fungicidal sprays. In fact harvest sprays were of little value under these circumstances. Improvement in the weather helped the situation in the late season, but the spore potential remained high, and the markets were glutted and unsatisfactory for the absorption of the heavy supplies of peaches, and rot continued to be troublesome.

The above brief account suggests that much of the difficulty and loss due to brown rot was largely a result of adverse weather, a heavy crop, and sluggish market conditions, all factors over which the producer has little control. At the same time there is a special importance attached to clean-up measures and care in handling the fruit under these circumstances. These operations include the removal of fallen fruits from the orchard, of cull fruits from the packing shed, and their disposal by burial in a trench or ditch. Every effort is required to avoid picking or handling rotted fruits in order to eliminate the danger of contaminating sound fruit, the containers, and the grading tables. Bruised or otherwise damaged fruits rot readily and constitute a real threat to adjacent fruits in the baskets. In this connection it may be pointed out that a high percentage of rot in the main Elberta variety occurs at the stem-end and follows the tears in the skin so commonly induced when this variety is picked. Freedom from this type of injury is apparently difficult to achieve. Nevertheless, it is of great importance and pickers must be instructed to exercise every care.

In conclusion it is evident that the control of brown rot remains a difficult problem involving many factors and requires the concerted action and attention of the growers to spraying and other measures.

St. Catharines, Ontario. G.C. Chamberlain

AUSTRALIAN NOTES

An Attempt to Eradicate Apple and Pear Scab: In 1953 it was found by K. E. Hutton of the New South Wales Department of Agriculture that the scab fungus could be eradicated from infected apple leaves by spraying them before they fell from the tree with phenyl mercuric chloride at high concentration (Nature, Vol. 174, p. 1017, Nov. 27th, 1954). Subsequently several attempts have been made to eradicate the disease from isolated orchards by a single spray application. In each case the eradicant spray was applied in the autumn and no sprays were applied the following season. Although the results have been spectacular complete success has not yet been achieved in any orchard. The attempts at eradication have nevertheless increased confidence in the feasibility of this method of dealing with this costly disease. During April 1956 it is proposed to embark on a scheme of eradication involving the treatment of every apple and pear tree in a small isolated district (Yetholme) in the Central Tablelands of New South Wales.

A local organising committee, consisting mainly of orchardists, has been elected to map the location of each pome fruit tree in the district. Every tree will receive pre-leaf fall treatment with 0.1 per cent. phenyl mercury chloride; during the 1956-57 season they will receive the normal programme of protective sprays, and the eradicant treatment will be repeated in the autumn of 1957.

Some encouragement is taken from the success of apple scab eradication in Western Australia. The disease first occurred there in 1930, and between then and 1947 there were seven outbreaks, each of which was eradicated. The method adopted by the Western Australian Department of Agriculture was to arrange special cover cropping and to bury fallen leaves by careful ploughing and hand spading. Climatic conditions in the Yetholme district are highly favourable to scab development, and should success crown our efforts there is hope of the method being applicable wherever grower co-operation can be arranged. No

Killing Capsid with MYSTO Sprayers

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evidence of bud scab carry-over has been found in New South Wales.

Diseases of Clovers: In recent years there has been great activity in Australia in establishing improved pastures containing one or more species of clovers. The plant pathologist, too, has been busy recording diseases of clover new to Australia. Last season there was much debate on the identity of a species of Sclerotinia which caused patches of "white slimy mould" in otherwise perfect stands of clover in several States of Eastern Australia. Was it S. trifoliorum, and is S. trifoliorum valid anyhow? Evidence seems to trend towards our species being sclerotiorum if we take as broad a view as Purdy (Phytopathology, 45, 8, 1955; R.A.M., 35, p. 45) does.

Among the pathogens recorded for the first time in New South Wales on subterranean clover was Kabatiella caulivora. This outbreak of scorch extended over 300 acres in the Berrigan Irrigation Area and severely reduced the grazing in about 50 acres.

In Western Australia at Talbot Brook, one hundred miles east of Perth, there has been a record of Urophlyctis (Olpidium) trifolii, also on subterranean clover.

C.J. Magee

NEW ZEALAND NOTES

Staff Changes: Dr. H. Jacks is leaving the Plant Diseases Division, Auckland, to take up the position of senior lecturer in soil science at Massey Agricultural College, Palmerston North. He intends to continue his research on the microbiological changes which follow soil sterilisation.

I.A.M. Cruickshank, of the mycology laboratory, Lincoln, who has made important contributions to our knowledge of seed-borne diseases and rust diseases of field crops, has accepted a position with the Commonwealth Scientific & Industrial Research Department of Plant Industry at Canberra. He will be following up his recent work at Cambridge on the mechanism of disease resistance in plants, under the leadership of Dr. Muller.

R.M. Brien and Miss J.M. Dingley of the Plant Diseases Division have published a second supplement to a revised list of plant diseases recorded in New Zealand, and this has been published in the N.Z. J. Sci. & Tech., Sect. A, 37, 1, June, 1955. The fungous diseases of economic importance are caused by Phytophthora erythroseptica, Helminthosporium turcicum, Monochaetia unicornis, Urophlyctis alfalfae and Puccinia antirrhini. Verticillium dahliae is listed on 19 and Pseudomonas syringae on 18 additional host plants. Virus diseases of economic importance are cereal yellow dwarf, clover big vein virus, cauliflower mosaic, citrus quick decline, freesia mosaic, and lily mosaic.

A list of plant diseases recorded in South Pacific Territories by L.J. Dumbleton (Tech. Pap. 78, S. Pacific Commission) is a valuable record of virus, bacterial, and fungal diseases in the South Pacific Islands.

A.D. Thomson, Crop Research Division, D.S. & I.R., Lincoln, states that both serological and plant indicator methods are being used for the identification of potato virus X infections in New Zealand.

Serological laboratory tests of potato leaf material collected in the field are performed using the precipitin method. Antiserum and extracted sap (0.5 ml. of each) are mixed in small tubes in a water-bath maintained at 50°C. We have found that one technician can perform approximately 100 tests per day, which includes extracting and centrifuging sap and sterilizing laboratory equipment.

The agglutination technique described by Bradley (Amer. Potato J., 29, pp. 289-91, 1952) is now being used to test material directly in the field and also in the laboratory; if greater accuracy is required the precipitin method is used. One technician can perform about 50 tests per hour using this method.

We are using Gomphrena globosa in preference to other indicators in virus X testing work. All virus strains isolated in New Zealand react on G. globosa, whereas a few are symptomless on Datura stramonium and on other virus X indicator plants. Each sample to be tested is inoculated to two leaves since occasionally leaves fail to become infected. Our results have shown that pro-

vided adequate controls are kept serological methods are satisfactory, and we have no evidence of plants known to be infected with virus X not giving precipitin or agglutination reactions.

F. J. Newhook, Plant Diseases Division, Auckland, says that by washing diseased pear tree bark for 30 minutes in running tap-water before plating (with or without surface sterilization with sodium hypochlorite) he obtained up to a five-fold increase in successful isolations of Pythium compared with the normal method, where small pieces of bark are rinsed in sodium hypochlorite (10 to 20 per cent. solution of a saturated commercial preparation) and covered with melted water agar at 48°C. Plating pieces of diseased tissue directly (without surface sterilization) gave even fewer Pythium isolations. The washing appeared to remove a fungistatic material present in the detached bark. Details of this Pythium species attacking the inner phloem tissue of pear trunks and branches will be published elsewhere.

Harvey C. Smith

NEWS FROM INDIA

Foorkey disease of the larger Cardamom (Amomum subulatum): This virus disease is destructive in the Darjeeling area of West Bengal. Diseased plants give out many vegetative shoots which do not grow beyond a few inches in height and do not flower. The diseased leaves show faint chlorosis. The virus is not sap-transmissible but is easily transmitted by the banana aphid (Pentalona nigronervosa) which breeds plentifully on cardamom plants. The disease appears to be distinct from the one that affects the smaller cardamom (Elettaria cardamomum) in south India, although both the viruses are transmitted by the same insect vector. A wild Amomum sp. has been established as a differential, on which both the viruses produce their characteristic symptoms.

New records of Plant diseases from India: Citrus melanose caused by Phomopsis citri from Assam; leafspot of tomato caused by Cercospora fuliginea, from Orissa and Madhya Bharat; leafspot of nasturtium (Tropaelium majus) caused by Heterosporium tropaeoli, from Mussoorie (U. P.); rhizome and root rot of turmeric (Curcuma longa) due to Pythium graminicolum, from Madras; rust of grapefruit due to a new species of Uredo, U. citri Vaheeduddin, from Hyderabad; Alternaria blight of castor due to Alternaria ricini, from U. P.; anthracnose of guar (Cyamopsis tetragonaloba) due to Colletotrichum capsici f. cyamopsicola; wilts of watermelon and peas due to Fusarium oxysporum f. niveum and f. pisi, respectively, from Bombay; target spot of tomato due to Corynespora cassiicola, from Orissa; and powdery mildew of papaw due to Oidium indica and O. caricae, from Bombay and Delhi, respectively.

R.S. Vasudeva

C. A. B. Liaison Officer for India

Shri M. S. Randhawa, M. Sc., F. N. I., I. C. S., has been appointed as C. A. B. Liaison Officer for India vice Mr. Damle. He is Vice-president of the Indian Council of Agricultural Research, at Multistoreyed Building, Queen Victoria Road, New Delhi.

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NEWS FROM AFRICA

Uganda

Panama disease (Fusarium oxysporum f. cubense) of bananas was observed in two new areas, Toro and Bugisu, and was confirmed anew from near Kampala. The varieties affected were of the sweet and roasting types, which are known to be highly susceptible in Uganda. A detailed survey in Ankole showed the disease to be now widespread but not serious, since the commoner beer and boiling types seem to be highly resistant. A fruit disorder resembling cigar end rot is serious in Toro and has yielded a Fusarium sp. in culture.

Puccinia polysora was again widespread on maize but appeared to be causing little damage. The breeding programme to incorporate resistance from South American maizes into local types has been continued under the co-ordination of Dr. H.H. Storey, of E.A.A.F.R.O., Kenya. Some 150 Muratha lines now contain this resistance fully incorporated, and incorporation is being continued for K.8. It is hoped to increase resistance to the streak virus, but susceptibility to leaf blight (Helminthosporium turcicum) may be enhanced. The whole field of maize breeding in East Africa has been reviewed by the Specialist Committee on Agricultural Botany, and is now being co-ordinated.

Ratoon stunting disease of sugar-cane is being studied in field trials to determine the effect of planting heat-treated setts. Trials using this material have been laid down, and already heat treatment appears to have increased vigour.

Kawanda is now being used as a quarantine station for sugar-cane in its second year and twenty-three varieties new to East Africa have been received from the E.A.A.F.R.O. Plant Quarantine Station, Muguga. After further observation for one year they will be available for distribution.

Studies on the control of coffee leaf rust (Hemileia vastatrix) have continued at Kawanda. Satisfactory control has been maintained by spraying with 0.3 per cent. perenox and the "tonic" effect is much in evidence at certain times of the year. By spraying robusta at monthly intervals the yield has been increased by two and a half times.

Fifteen varieties of rice have been found to possess a high level of resistance to blast (Piricularia oryzae),and these have been sent to the rice-growing areas of Eastern Uganda for further trial.

A survey of the early incidence of black arm disease (Xanthomonas malvacearum) of cotton showed a low percentage of plants infected with main stem lesions in areas where seed dressing with copper oxide had been introduced. The average level of infection was 7 per cent. as compared with 57 per cent. for the same area in the previous year, when no dressed seed was issued.

Seed dressing trials on maize, beans, and groundnuts were begun during the year, using mercurial and non-mercurial fungicides, with and without BHC insecticide. No responses were detected in maize and beans but the yield of groundnuts was increased, largely as a result of increased stands, by all treatments, the best being the non-mercurial fungicide alone.

The groundnut varieties Mwitunde and Kanyoma were introduced from south Tanganyika because of their reputed resistance to rosette virus and leaf spots (Cercospora arachidicola and C. personata), respectively, but both were susceptible at Kawanda.

Late blight (Phytophthora infestans) of tomatoes appeared at Kawanda and is already making tomato cultivation difficult unless precautionary spraying is done.

B.J.T. Baldwin

STUDY WORK ON POTATO BLIGHT EPIDEMICS

The Plant Pathology Laboratory, Milton Road, Harpenden, England, (Director: W.C. Moore) is carrying out a comparative study of the epidemics of blight (Phytophthora infestans) that have occurred on potatoes in many parts of the world during the post-war period. This mid-twentieth century review of the impact of the disease was suggested by Professor A.J. Riker, of the University of Wisconsin, and has been rendered possible by financial aid from the Wisconsin Alumni Foundation. A.E. Cox has been seconded from the N.A.A.S. to work with E.C. Large on this project. The Laboratory would greatly appreciate information from all parts of the Commonwealth for inclusion in the review.

It is hoped that the review will include particulars of the frequency of 'severe-blight' and 'little-or-no-blight' seasons at principal potato-growing centres in each country, with the dates of outbreaks of the disease and of, say, 90 per cent. foliage destruction on one or two of the principal varieties grown in relation to planting and lifting dates, and to yield figures. Meteorological information, in the first instance monthly rainfall and temperature figures, will also be needed, but it is hoped that in the main these will be found accessible in publications available in this country.

Eye-witness accounts of the incidence of blight, its economic significance, and special problems of control under local conditions would be especially helpful to supplement numerical data obtainable from spraying or varietal trials. News of any special investigations or survey work that should be noted in such a world review would also be welcomed.

ENVIRONMENTAL CONTROL APPARATUS

Request for Information

Dr. J.P. Hudson, Head of the Department of Horticulture, University of Nottingham School of Agriculture, Sutton Bonington, Loughborough, England, is preparing a directory of equipment at present in use in universities and research stations in Great Britain for providing control of experimental environments. It is hoped eventually to publish the directory under the title "Environmental Control Equipment in Britain" as Miscellaneous Publication No. 8 of the Department. After preliminary enquiries a first draft has been prepared and Dr. Hudson will send copies of the draft to any interested individuals or organizations in Britain who have not already been referred to and who would be willing to furnish details of their installations for inclusion in the final publication.

Following publication of the British directory, Dr. Hudson is hoping to gather information about environmental control equipment in use in other parts of the world with a view to producing a more comprehensive publication. This would not only describe various installations but would also discuss in more detail the different approaches to control of each environmental factor, with, it is hoped, comments by users of the various systems and estimates of relative costs. In preparation for this second project Dr. Hudson would be glad to hear from workers in any part of the world who are using environmental control equipment for experimental work with plants in order that he can correspond direct and gather the information required for the broader survey. [See C.P. News, Oct. 1955, p. 57.]

Scientific Instruments Exhibition

A permanent exhibition of scientific instruments has been opened at 20, Queen Anne Street, London, W.1., under the auspices of the Scientific Instrument Manufacturers' Association of Great Britain. A catalogue library is being built up and enquiries from overseas visitors will be welcomed.

Mr. R.W. Wikramanayake, C.C.S., assistant secretary to the Government, Ministry of Agriculture and Food, Colombo, Ceylon, has been appointed C.A.B. LIAISON OFFICER FOR CEYLON vice Mr. A.J. Joseph.

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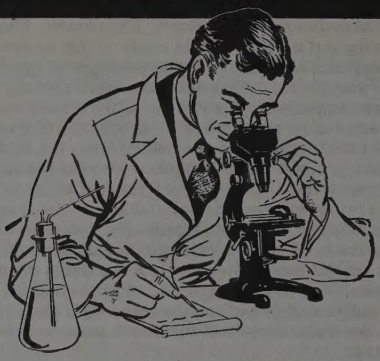

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